

Sub Spec
#9/B(~~AE~~)
5-10-04

Amendments to the Specification:

Page 1, between the title and line 1 insert:

CROSS REFERENCE TO RELATED APPLICATIONS

Applicants claim priority under 35 U.S.C. §119 of Austrian Application No. A 1890/98, filed on November 12, 1998.

b1
Applicants also claim priority under 35 U.S.C. 365 of PCT/AT99/00260, filed on November 3, 1999. The international application under PCT article 21(2) was not published in English.

BACKGROUND OF THE INVENTION

1. Field of the Invention --

Same page, replace the paragraph beginning on line 1 with the following rewritten paragraph:--

b2
The invention relates to a pivotable binding system between a sports device and a tread surface for a user's foot as well as a shoe and sports device for the binding system as outlined in the generic parts of claims 1, 23, 28 and 29. --

Same page, between lines 3 and 4, insert:--

b3
2. Description of the Prior Art

Page 2, between lines 8 and 9, insert:--

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SUMMARY OF THE INVENTION --

Replace the paragraph bridging pages 2 and 3 with the following rewritten paragraphs:--

This objective is achieved by the invention ~~due to the features outlined in claim 1 or 23.~~ with a pivotable binding system mounted between a sports device extending in a longitudinal direction and a tread surface of a sport shoe, which comprises a single binding element consisting of a lever, a first hinge mechanism joining one end of the binding lever to a front end of the tread surface, the first hinge mechanism including a first pivot axis extending substantially perpendicularly to a vertical plane extending in the longitudinal direction, and a body integral with or affixed to the sports device and rollingly supporting the front end of the tread surface for gliding on a rolling track of the body along an arcuately curved rolling path for displacing the front end of the tread surface towards the sports device. A second hinge mechanism joins an end of the binding lever opposite the one end to the body rollingly supporting the front end of the tread surface, the second hinge mechanism including a second, stationary pivot axis extending substantially perpendicularly

b5

to a vertical plane extending in the longitudinal direction.
The first pivot axis is on a higher level than the second pivot
axis, and is pivotable along the curved rolling path about the
stationary pivot axis from an initial rest position to a
displaced position.

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The particular advantage of this design is that relatively few and simple components imitate the natural rolling action of the foot across the bottom of the toes so that the performance of every user can be enhanced. Surprisingly, however, the enhanced performance which can be achieved by using the design proposed by the invention is not accompanied by any impairment to comfort. On the contrary, comfort is perceptibly increased due to the harmonious or rounded movement of the binding system. The combined or largely rigidly coupled motion of the user's foot in translation and rotation relative to the sports device during the active phase of the binding system. i.e. when assuming a specific pivot position, gives the user a feeling of stability and functional safety. As a result, he can concentrate on the respective performance and does not have to consciously concentrate his efforts on a perfect rolling motion since this is pre-programmed by the binding system to a certain degree. Furthermore, the binding system consists a few individual components, which makes the design optimum in terms of weight whilst nevertheless enabling the advantageous rolling

B5

motion in translation and rotation. At the same time, any undesirable movement between the user's foot and the sports device, such as twisting about a vertical axis, can be reliably prevented, thereby producing a high resistance to force. Because of the small number bearing points, friction losses between the linking parts of the binding system can be kept particularly low, so that the ~~use's~~ user's potential to perform can be largely converted into kinetic energy to propel the sports device along. Another important advantage resides in the fact that the sole of the sport shoe, for example a cross country shoe, can be made to a more bend-resistant design than similar conventional sport shoes because the harmonious or flowing movement needed for an optimum forward propulsion can be produced by the binding device. The natural forward rolling motion across the heels when walking or running is simulated by the binding system proposed by the invention, thereby enhancing comfort when using the sports device. Because the sport shoe can be made relatively more resistant to bending, the driving energy applied by the user can be more effectively converted into forward driving energy, thereby simultaneously enhancing performance without, as one might expect, impairing comfort.--

Page 3, cancel the six paragraph from line 10 to end of page.

Page 4, cancel all seven paragraphs.

Page 5, cancel the six paragraphs from line 1 to line 15.

Same page, replace the paragraph in lines 16 and 17 by the following rewritten paragraph:--

b6 Also of advantage is another embodiment described in claim 25, 53 since it always forces the sports device into a defined initial or rest position relative to the sport shoe.--

Same page, replace the paragraph in lines 18-20 by the following rewritten paragraph:--

b7 The advantage of the In an advantageous embodiment described in claim 26 is that in which the lever can be accurately guided and is capable of withstanding high forces. the body rollingly supporting the front end of the tread surface defines a recess housing a predominant portion of the lever, and a stop element in the recess restricts the pivoting movement of the lever about the stationary pivot axis.

Kinematically detrimental lever positions can also be prevented due to the fact that the pivoting motion is restricted.--

Cancel the paragraph bridging pages 5 and 6.

b8 Page 6, cancel the two paragraphs from line 2 to line 7.

Same page, between lines 7 and 8 insert:--

BRIEF DESCRIPTION OF THE DRAWING --

Same page, cancel the five paragraphs from line 11 to the end of the page.

Page 7, cancel the paragraph on lines 1 and 2.

Same page, cancel the two paragraphs from line 3 to 6 and replace with the following rewritten paragraphs:--

b9 Fig. 7 1 is a very simplified, schematic cross-section of another embodiment of a binding system as proposed by the invention, seen from a side view;

Fig. 8 2 is a very simplified, schematic diagram of the binding system illustrated in Fig. 7 1 from a front view along arrow VIII II.

Same page, between lines 6 and 7, insert:--

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT --

Same page, cancel the paragraph from lines 7 to 13.

Same page, replace the paragraph from line 14 to 17 by the following rewritten paragraph:--

B11
Figs. 1 and 2 to 3 illustrate one embodiment of a binding system 1 as proposed by the invention, between a sports device 2 in the form of a sliding or rolling member 3, such as a ski 4 or a roller-skate for example, and a tread surface 5 for a user's foot. The tread surface 5 for the user's foot is preferably a shoe sole 6 of a sport shoe 7.--

Page 8, cancel the five paragraphs from line 3 to line 23.

Cancel the paragraph bridging pages 8 and 9.

Page 9, cancel the five paragraphs from line 2 to the end of the page.

Cancel all the paragraphs on pages 10 to 20.

Page 21, cancel lines 1-5 and the four paragraphs from line 6 to 19.

Replace the paragraph bridging pages 21 and 22 by the

following rewritten paragraph:--

b12
The binding system has at least one ~~in this case, the~~ binding element 11 is provided in the form of lever 67 between the tread surface 5 for the user's foot and the sports device 2, which is the only element binding sport shoe to the sports ~~device or the rolling body 22~~. The binding element 11 or lever 67 is hinge-mounted on an end 18 of a ~~the~~ rolling body 22 affixed to sports device 2, on which a forward end of sports shoe 7 rolls at the end region 18 co-operating with the rolling body 22. In the end region 17 spaced at a distance therefrom in the longitudinal region - double arrow 9 - the binding element 11 or lever 67 is joined to the shoe sole 6 or a rolling element 69 in shoe sole 6 via the hinge mechanism 45, or i.e. it is hinge-mounted on the shoe sole 6. The rolling element 69 forming one linking part link 70 of the hinge mechanism 45 can be releasably or non-releasably secured to the underside of the shoe sole 6 or alternatively may be integrated in the shoe sole 6, in particular i.e. embedded therein.

Page 22, replace the paragraph from lines 5-14 by the following rewritten paragraph:--

b13
The hinge mechanism 68 in the other end region 18 of the lever 67 between the latter and the rolling body 22 forms a

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pivot axis 71 extending perpendicular to the vertical plane 8. The lever 67 is mounted in a recess 72 of the rolling body 22. The recess 72 is provided in the front end region 36 of the rolling body 22 relative to the direction of travel - arrow 19 - and therefore houses the major part of the lever 67. The recess 72 may be used as forms a guide system for the lever 67. The recess 72 also has a stop element 73, which restricts the pivoting movement of the lever 67 about the pivot axis 71. In particular, the stop element 73 prevents the shoe sole 6 or and rolling element 69 from lifting off the rolling body 22 by restricting the ability pivoting range of the lever 67 to pivot about the pivot axis 71 in the direction pivoting away from the sports device 2 so that the co-operating components are constantly in contact with one another.

Same page, replace the paragraph from lines 19-24 by the following rewritten paragraph:--

b14

In the direction of when projecting onto the vertical plane 8, the lever 67 has curvature or contour in which the centre of curvature whose center lies above the top face 15 of the sports device 2. Moreover, the lever 67 extends between the rolling body 22 and the shoe sole 6 substantially parallel with the tread surface 5. Specifically, when the binding system 1 is in the initial or rest position, as illustrated, a line joining

b14
the pivot axes 71 and 46 subtends an acute angle with a horizontally extending plane, in particular an angle of approximately 2° and 30° . --

Replace the paragraph bridging pages 22 and 23 with the following rewritten paragraph:--

b15
The lever 67 is designed so that the pivot axis 46 between the lever 67 and the shoe sole 6 is disposed at a higher lever than the stationary pivot axis between the lever 67 and the rolling body 22 when in the rest or initial position illustrated in full lines in Fig. 5 7 and 6 8. As a result, when the sport shoe 7 pivots relative to the sports device 2 due to the pivoting action of the lever 67 about the pivot axis 71, the shoe sole 6 is simultaneously displaced in the direction in which the sports device 2 is moving or travelling - arrow 9 (see phantom lines in Fig. 7). In particular, raising the sports shoe 7 forces a relative displacement between the rolling body 22 and the shoe sole 6 causing the sport shoe 7 to be displaced in the direction of movement or travel relative to the sports device 2 and hence This causes a lengthening of the stride. This effect is produced due to the fact that the pivot axis 46 is able to move on a circular course 75 about the stationary pivot axis 71 and because the pivot axis 46 between the sport shoe 7 and the lever 67 is disposed at a higher level

b15

than the pivot axis 71. In particular, in the initial or rest position illustrated in full lines in Figs. 7 and 8, the pivot axis 46 is located in the top half of the circular course 75 around the pivot axis 71 and, when the heel of the sport shoe 7 is lifted off the sports device 2, moves on the circular course 75 in the direction towards the top face 15 and simultaneously in the longitudinal direction of direction of forward movement - arrow 9. --

Page 23, replace the paragraph from lines 15 to 20 with the following rewritten paragraph:--

B16

At least one of the hinge mechanisms 45, 68, but preferably both hinge mechanisms 45, 68, co-operate with include an energy storage device 76, 77, i.e. in particular in the form of coil springs 78, 79. These energy storage devices 76, 77 or coil springs 78, 79 force the tread surface 5 or of shoe sole 6 into the illustrated initial or rest position in which they extend parallel with the top face 15 of the sports device 2 and apply a defined resistance, which can be overcome, against an upward pivoting movement of the heel of sport shoe 7 relative to the sports device 2.--

[Same page, replace the paragraph from lines 21-24 with the following rewritten paragraph: --]

When the sport shoe 7 is pivoted relative to the sports device 2, the rolling element 69 or of the shoe sole 6 slides on along the rolling path track 27 of the rolling body 22 in the direction towards the sports device 2 or in circular course 75, and moves the former back away from the sports device 2 when the heel region of the sport shoe 7 is placed on the guide member 43 or the top face 15 of the sports device 2. --

b16

[Same page, replace the paragraph from lines 25 and 26 by the following rewritten paragraph: --]

The guide member 43 and the rolling body 22 are preferably made as a single component, a gap 80 to the shoe sole 6 being left free between the aforementioned components. --

[Same page, replace the paragraph beginning on the last line to page 24, line 1 by the following rewritten paragraph: --]

By preference, the rolling element 69 also has side plates 58, 59 to form a lateral guide device 30 between the rolling element 69 and the rolling body 22. --

[Page 24, replace the paragraph from lines 2 to 8 by the following rewritten paragraph: --]

b1 b6

The shoe sole 6 of the sport shoe 7 may be of a more bend-resistant design than conventional crosscountry cross-country sport shoes 7 since the rolling movement can be produced by the binding system 1 proposed by the invention. By making the shoe sole 6 or the entire sport shoe 7 of a more bend-resistant design, a more effective repulsive force from the ground underneath the sports device 2 can be achieved. In addition, the sport shoe 7 is better guided relative to the sports device 2 and the forces applied by the user more efficiently converted into energy to generate forward propulsion with the sports device 2.

Same page, cancel the four paragraphs from line 12 to end of page.